

Serial No. 09/757,955

Docket No.: 55476US002

Amendments to the Specification

Amend the title as shown below in marked form:

**COATING DEVICE AND METHOD FOR IMPROVING THE UNIFORMITY
OF A WET COATING ON A SUBSTRATE USING PICK-AND-PLACE DEVICES**

Amend the paragraph at page 2, line 23 through page 3, line 2 as shown below in marked form:

Multiroll coaters (see, e.g., U.S. Patent Nos. 2,105,488; 2,105,981; 3,018,757; 4,569,864 4,569,864 and 5,536,314) can also be used to provide thin coatings. Multiroll coaters are shown by Booth and are reviewed in Benjamin, D.F., T.J. Anderson, and L.E. Scriven, "Multiple Roll Systems: Steady-State Operation", *AIChE J.*, V41, p. 1045 (1995); and Benjamin, D.F., T.J. Anderson, and L.E. Scriven, "Multiple Roll Systems: Residence Times and Dynamic Response", *AIChE J.*, V41, p. 2198 (1995). Commercially available forward-roll transfer coaters typically use a series of three to seven counter rotating rolls to transfer a coating liquid from a reservoir to a web via the rolls. These coaters can apply silicone release liner coatings at wet coating thickness as thin as about 0.5 to about 2 micrometers. The desired coating caliper and quality are obtained by artfully setting roll gaps, roll speed ratios and nipping pressures.

Amend the paragraph at page 14, lines 1 – 16 as shown below in marked form:

Fig. 11 shows a uniformity improvement station **110** that uses a train of pick-and-place roll contactors. Liquid-coated web **111** is coated on its upper surface prior to entering improvement station **110** using a coating device not shown in **Fig. 11**. Liquid coating caliper on web **111** spatially varies in the down-web direction at any instant in time as it approaches pick-and-place contactor roll **112**. To a fixed observer, the coating caliper would exhibit time variations. This variation may contain transient, random, periodic, and transient periodic components in the down web direction. Web **111** is directed along a path through station **110** and into contact with the pick-and-place contactor rolls **112**, **114**, **116** and **117** by idler rolls **113** and **115**. The path is chosen so

Serial No. 09/757,955

Docket No.: 55476US002

that the wet coated side of the web comes into physical contact with the pick-and-place rolls. Pick-and-place rolls 112, 114, 116 and 117 (which as shown in Fig. 11 all have the same diameter) are driven so that they rotate with web 111 but at speeds that vary with respect to one another. For example, there can be a speed differential between the substrate and at least one roll, or speed differentials between the substrate and two or more rolls, e.g., sinusoidal speed differentials, speed differentials having opposite signs for a portion of time, or speed differentials that are periodic and out of phase (e.g., by 180 degrees) with one another. The roll periods or speeds are adjusted to provide an improvement in coating uniformity on web 111. At least two and preferably more than two of the pick-and-place rolls 112, 114, 116 and 117 do not have the same speed and are not integer multiples of one another.

Amend the paragraph at page 17, line 31 through page 18, line 16 as shown below in marked form:

The embodiment of Fig. 17 as so far described can be used to produce a uniform coating on the belt itself, or to improve coating uniformity on a previously coated belt. The wet belt 170 can also be used to transfer the coating to a target web substrate 189. For example, target web 189 can be driven by powered roll 190 and brought into contact with belt 170 as belt 170 circulates around back-up roll 179. Rolls 179 and 190 are nipped together, thus forcing belt 170 into face-to-face contact with web 189. Upon separating from belt 170, some portion of the liquid coating will be transferred to the surface of web 189. When using the device to continuously coat the target web 189, liquid is preferably constantly added to belt 170 at region 182 on each revolution of the belt, and continuously removed at the nip point between rolls 179 and 190. Because following startup, belt 170 will already be coated with liquid, there will not be a three phase (air, coating liquid and belt) wetting line at stripe coating region 182. This makes application of the coating liquid much easier than is the case for direct coating of a dry web. Since only about one half the liquid is transferred at the 179, 190 roll nip, the percentage of caliper non-uniformity downstream from region 182 will generally be much smaller (e.g., by as much as ~~much as~~ half an order of magnitude) than when stripe coating a dry web without a transfer belt and

Serial No. 09/757,955Docket No.: 55476US002

passing the thus-coated web through an improvement station of the invention having the same number of rolls.